

FIG. 1

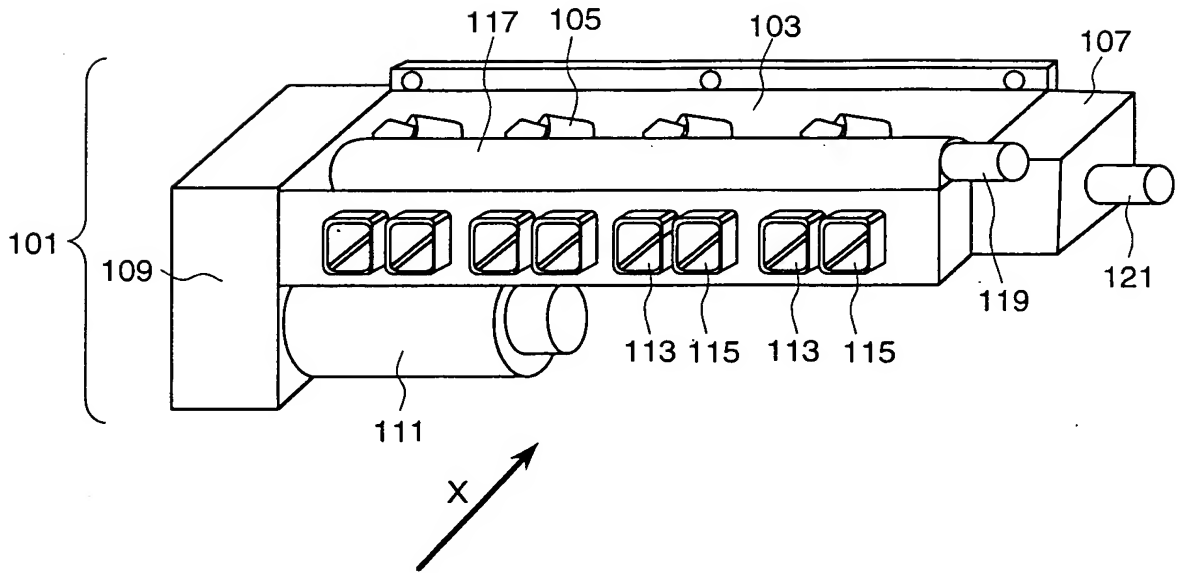


FIG. 2

X-DIRECTIONAL PLAN VIEW

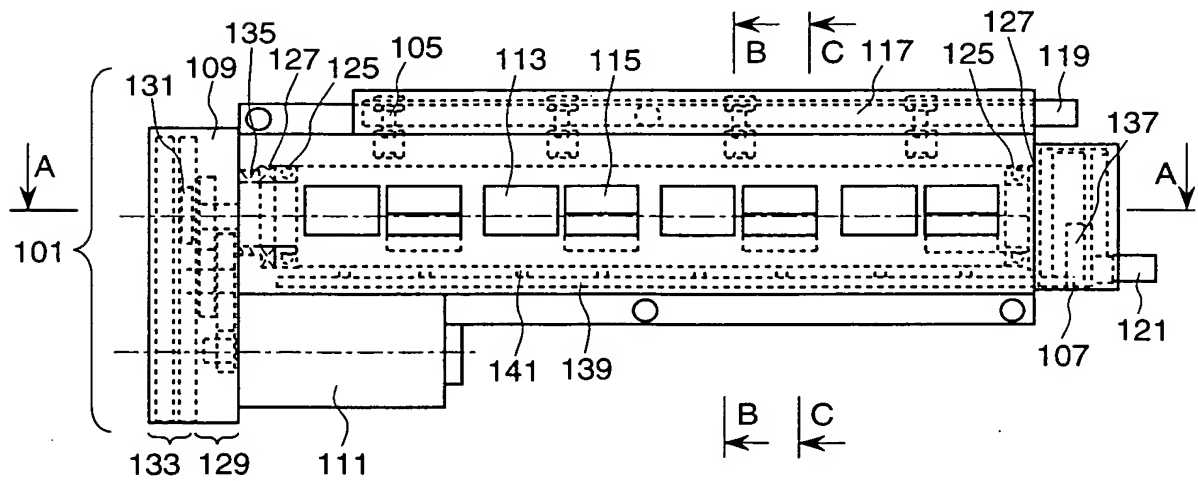


FIG. 3

A-A' CROSS-SECTIONAL VIEW

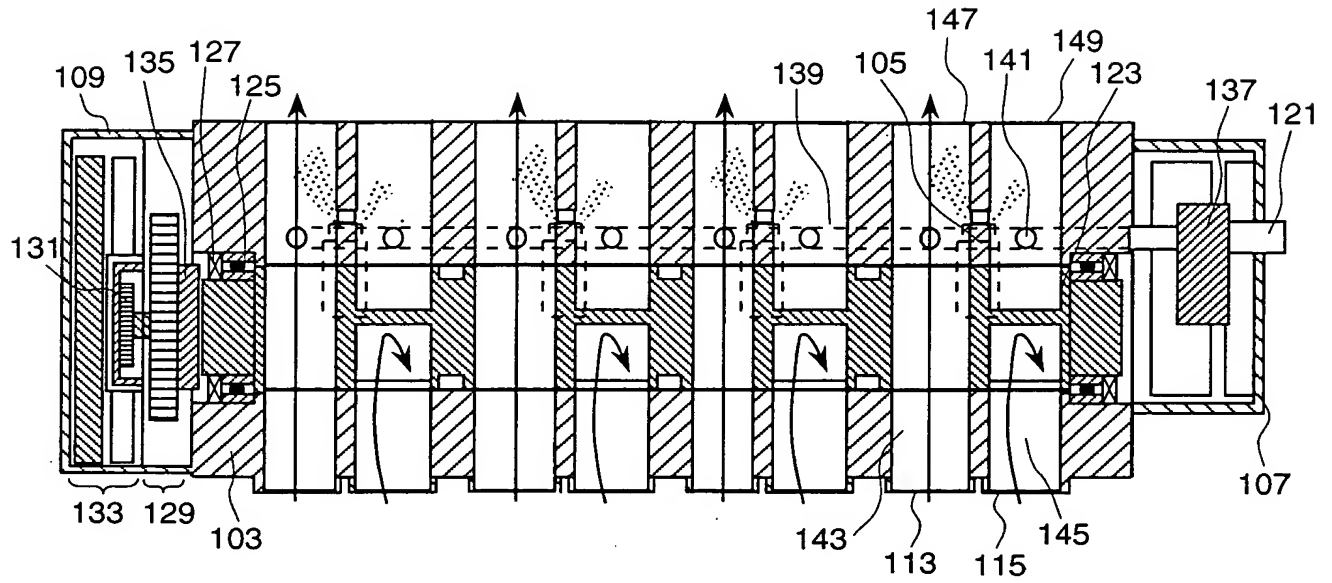


FIG. 4

B-B' CROSS SECTIONAL VIEW

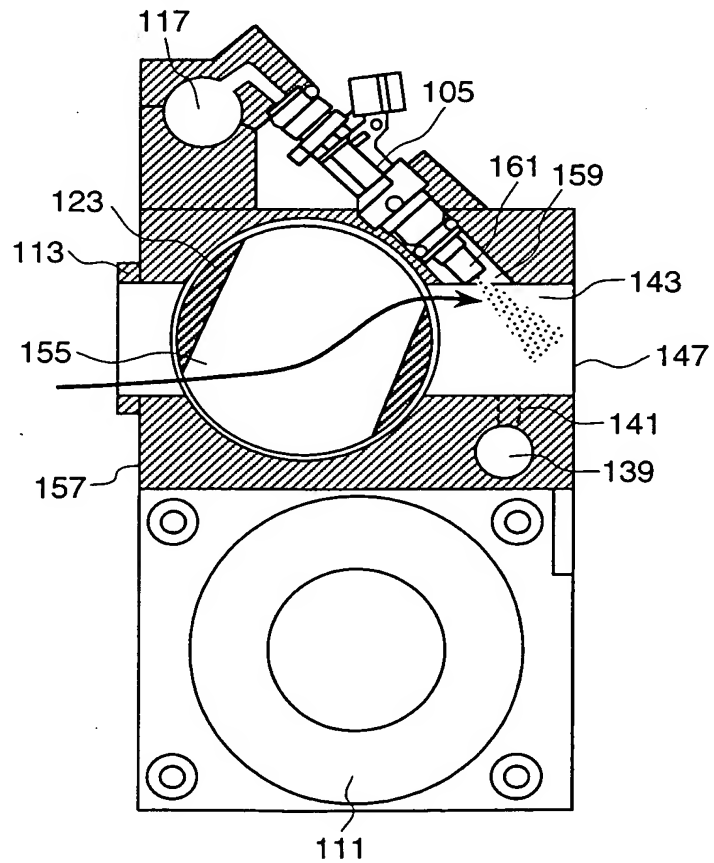


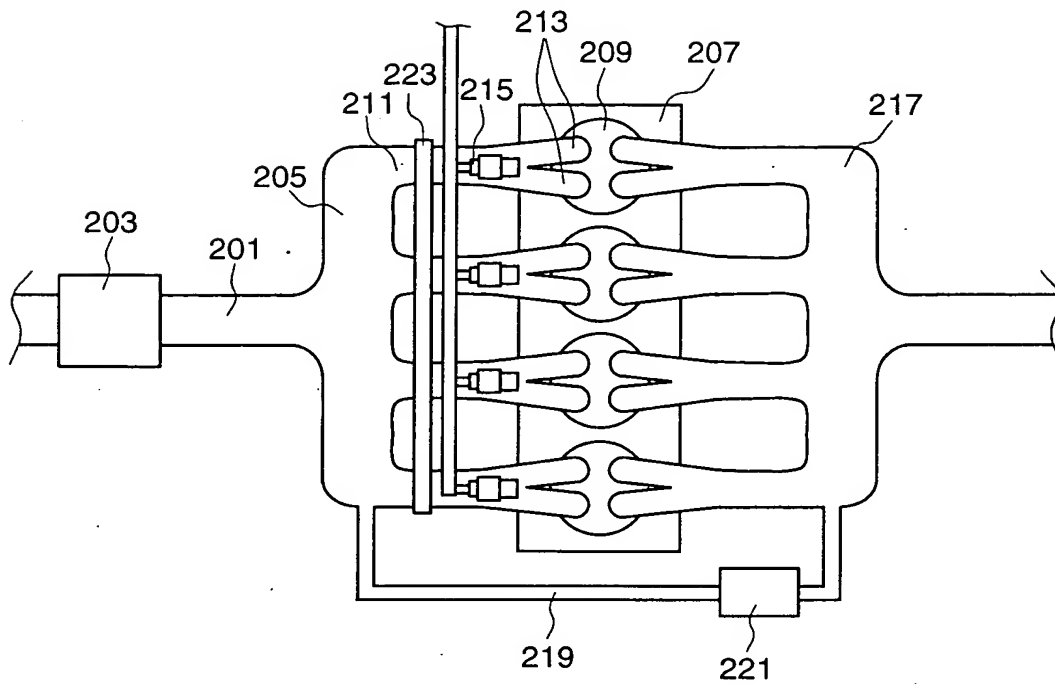
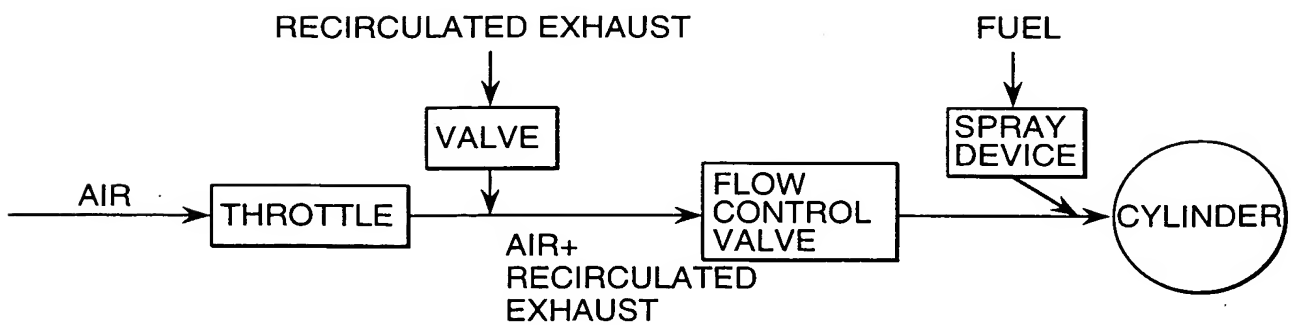
FIG. 5**FIG. 6**

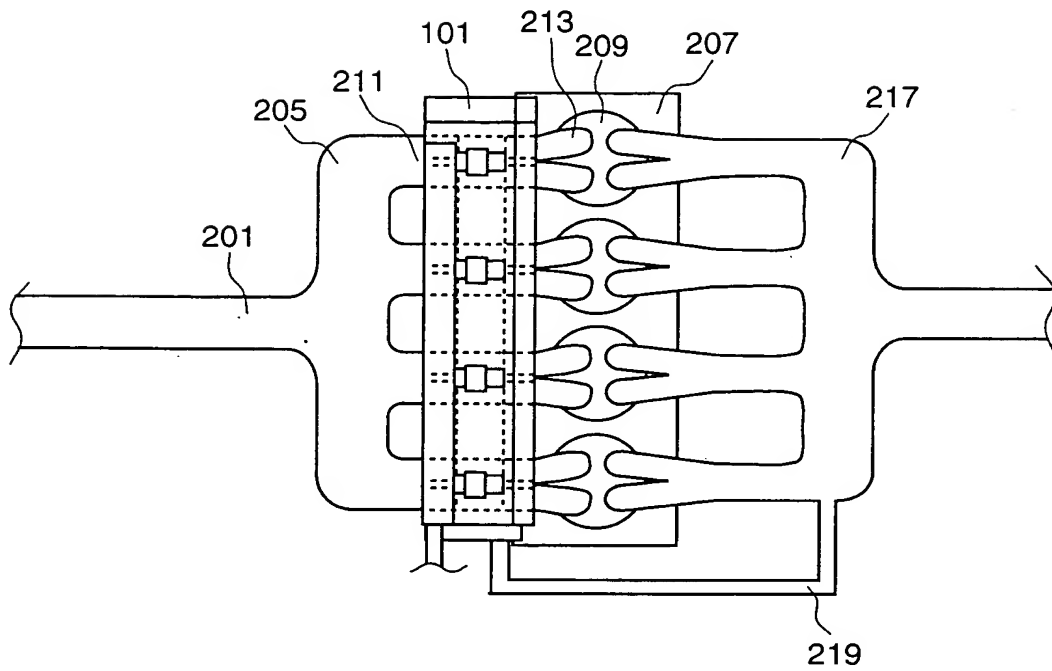
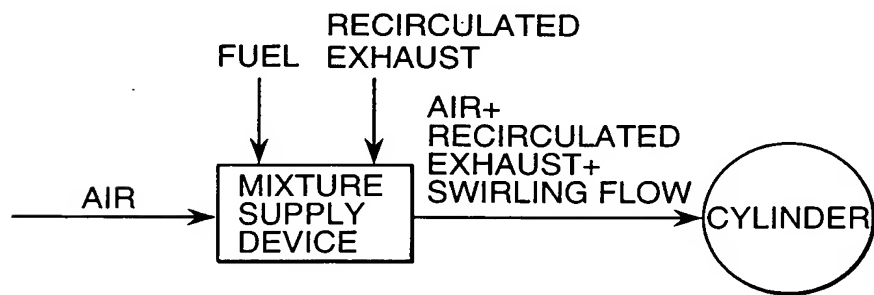
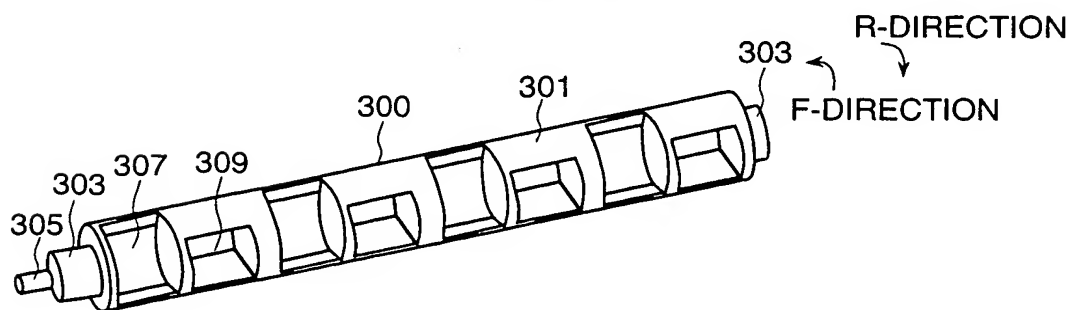
FIG. 7**FIG. 8****FIG. 9**

FIG. 10

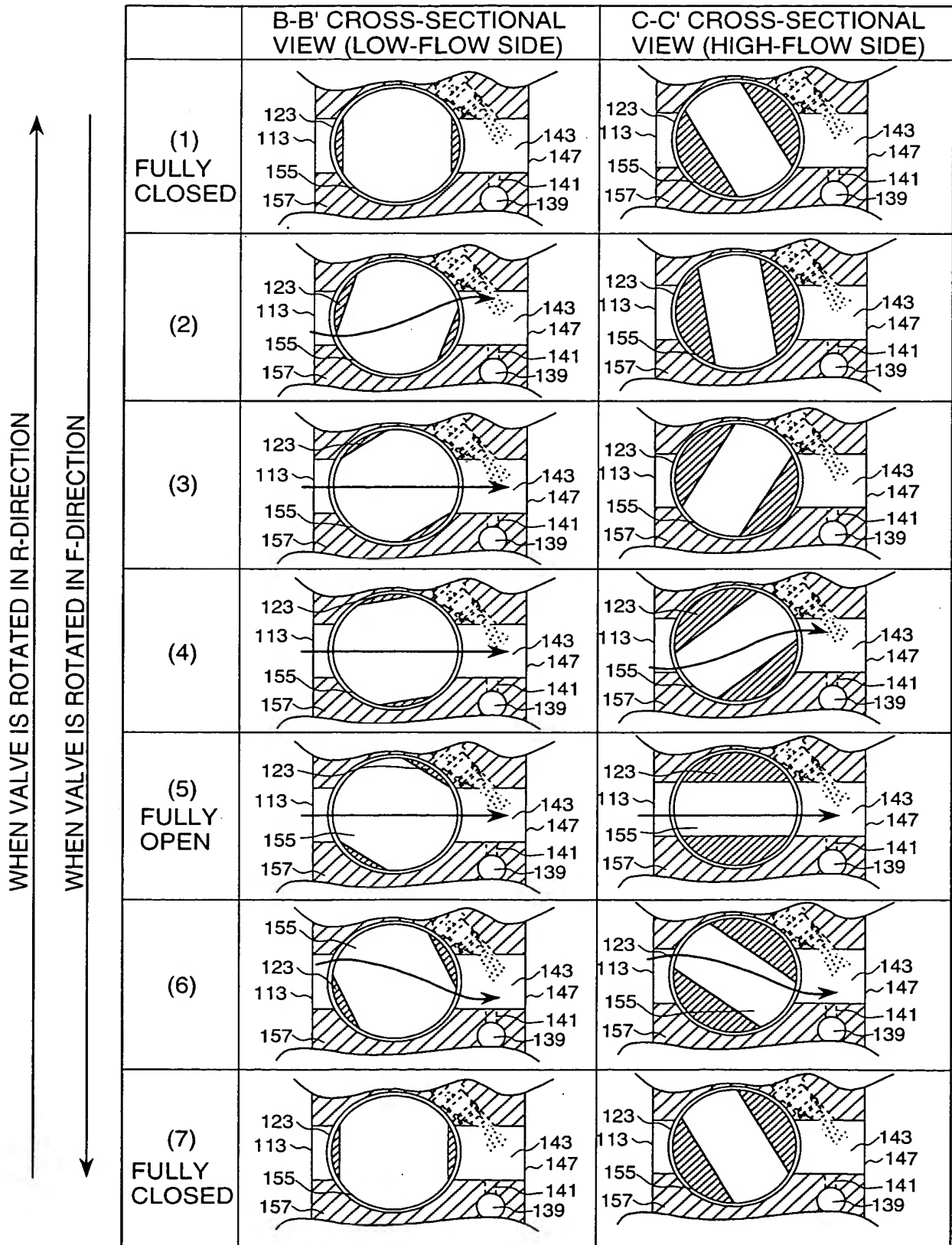


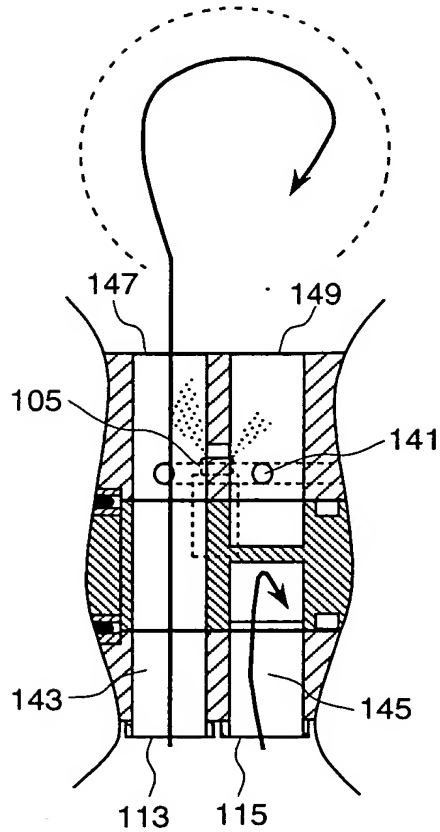
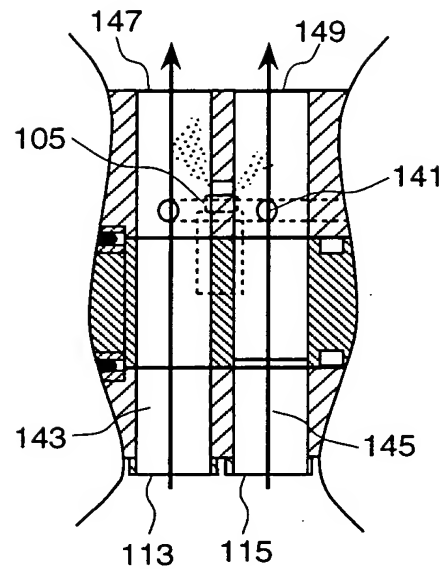
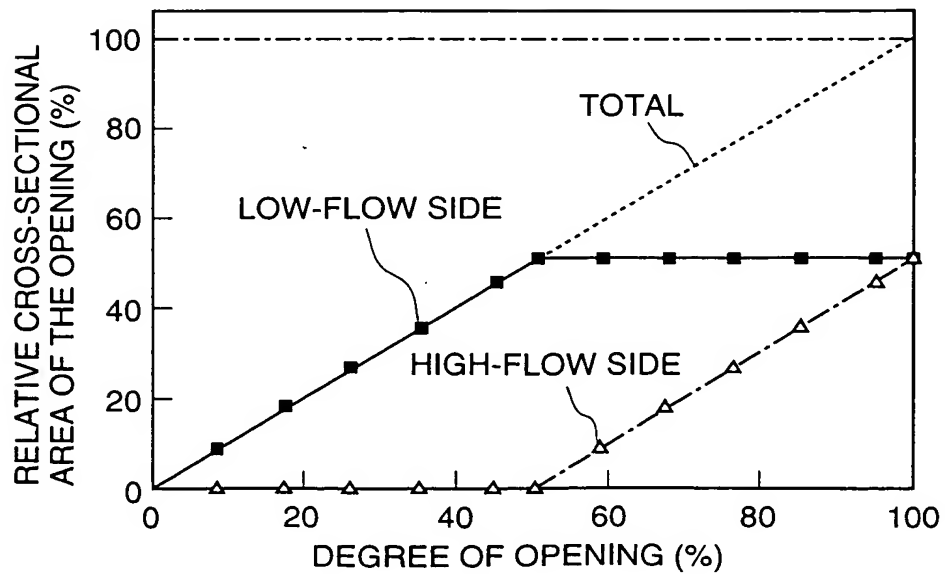
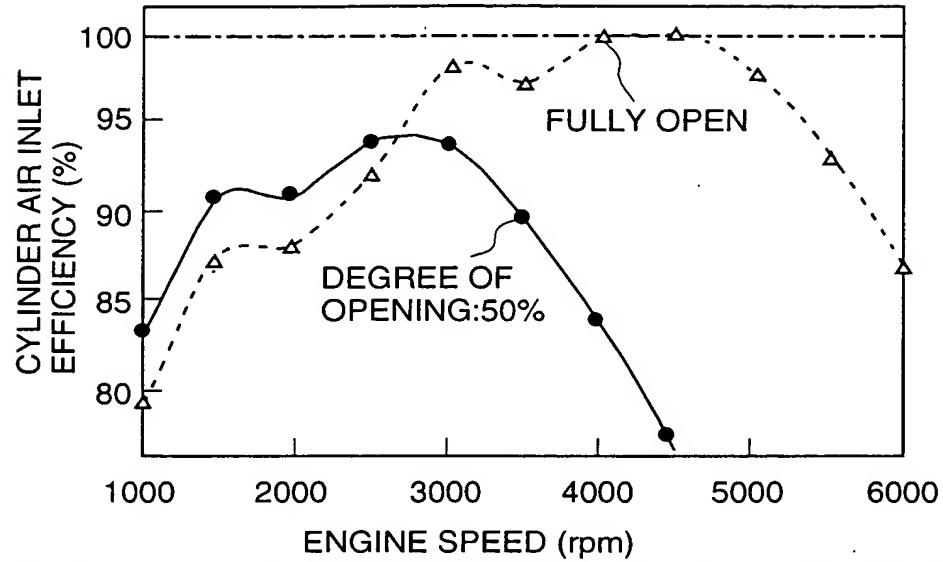
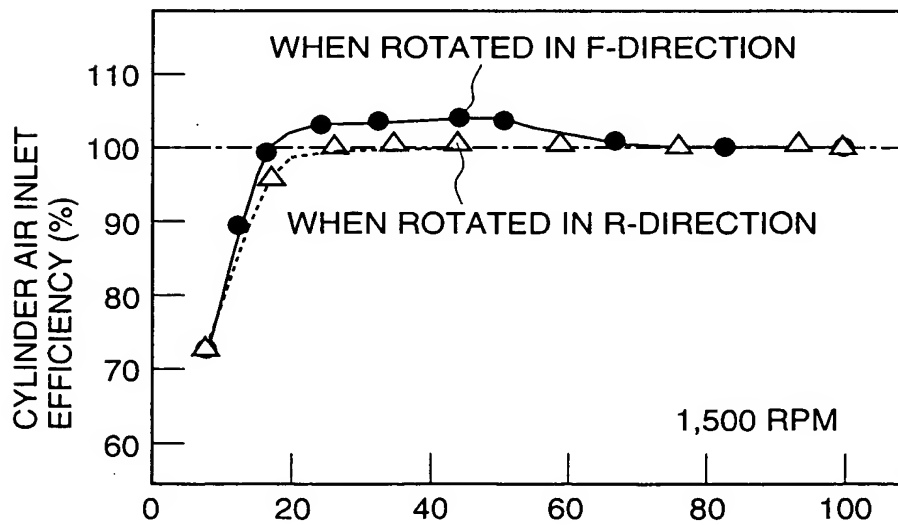
FIG. 11*FIG. 12**FIG. 13*

FIG. 14

(NOTE: THE EFFICIENCY OF AIR INLET AT 4,500-RPM ENGINE SPEED WITH VALVE FULLY OPEN IS TAKEN AS 100%)

FIG. 15

RELATIVE CROSS-SECTIONAL AREA OF THE OPENING (%)

(NOTE: THE EFFICIENCY OF CYLINDER AIR INLET WITH VALVE FULLY OPEN IS TAKEN AS 100%)

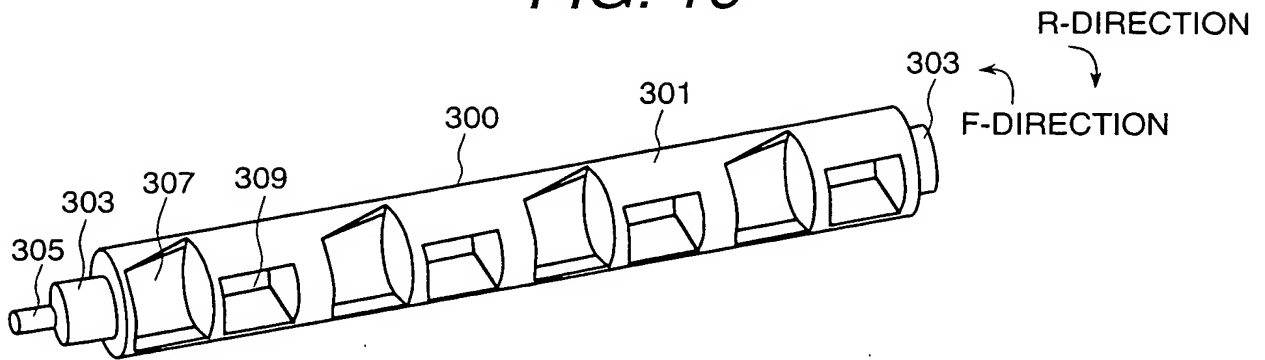
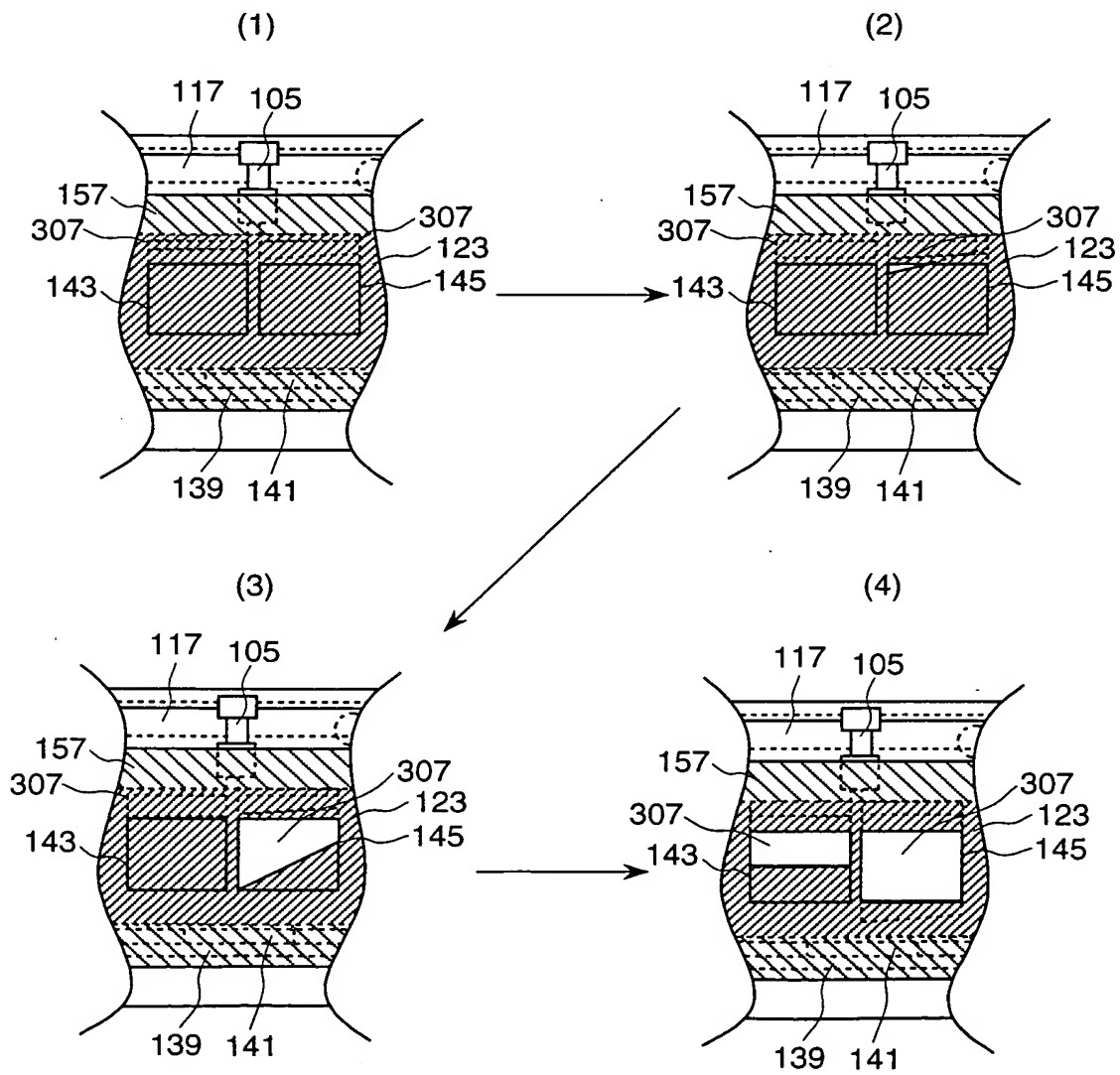
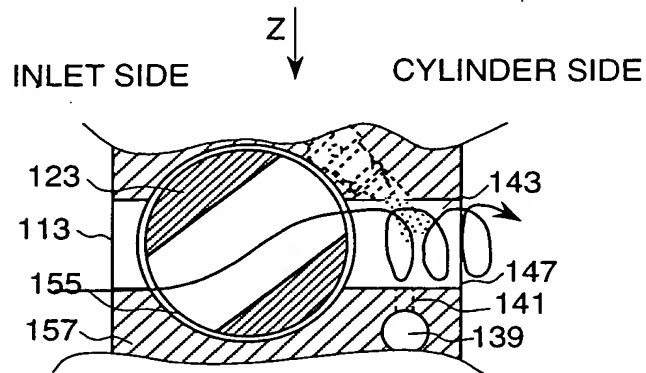
FIG. 16**FIG. 17**

FIG. 18

- (1) PARTIAL CROSS-SECTIONAL VIEW OF
AIR FLOW CONTROL VALVE 123 FROM THE
DIRECTION OF ITS ROTATIONAL AXIS



- (2) PARTIAL CROSS-SECTIONAL VIEW
FROM THE DIRECTION OF Z

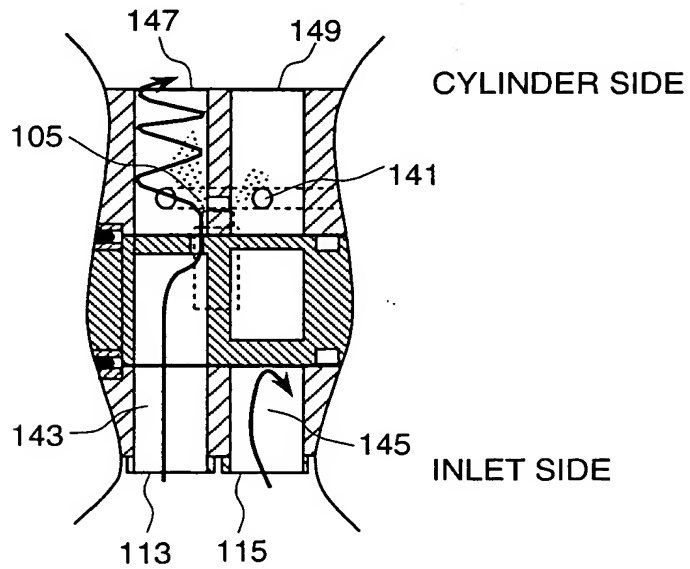


FIG. 19

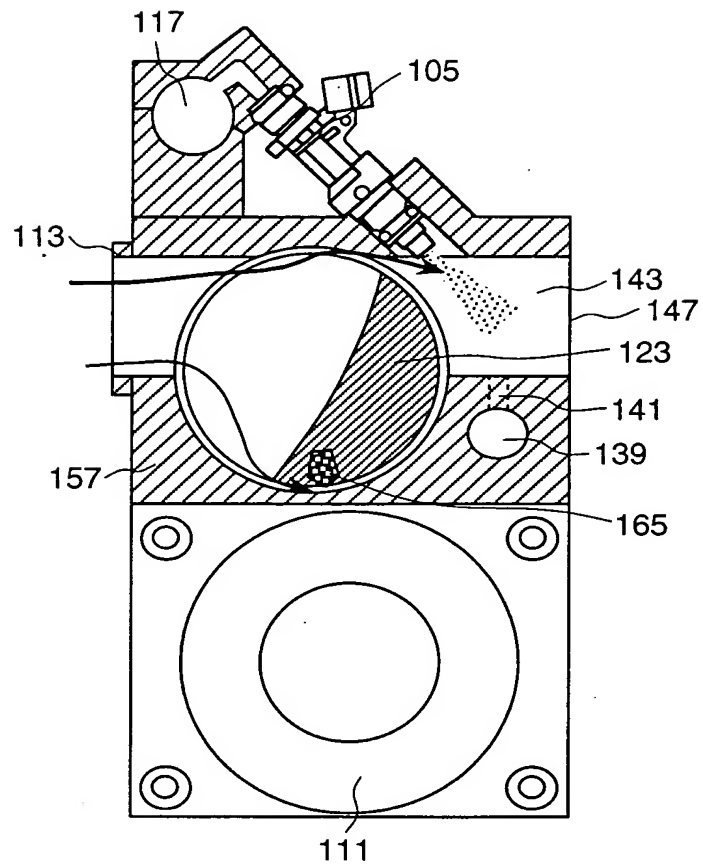


FIG. 20

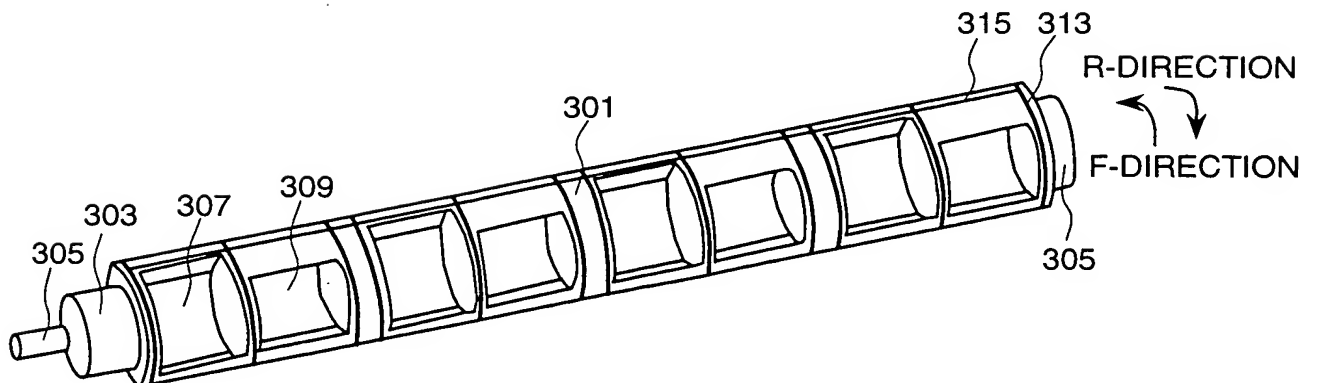


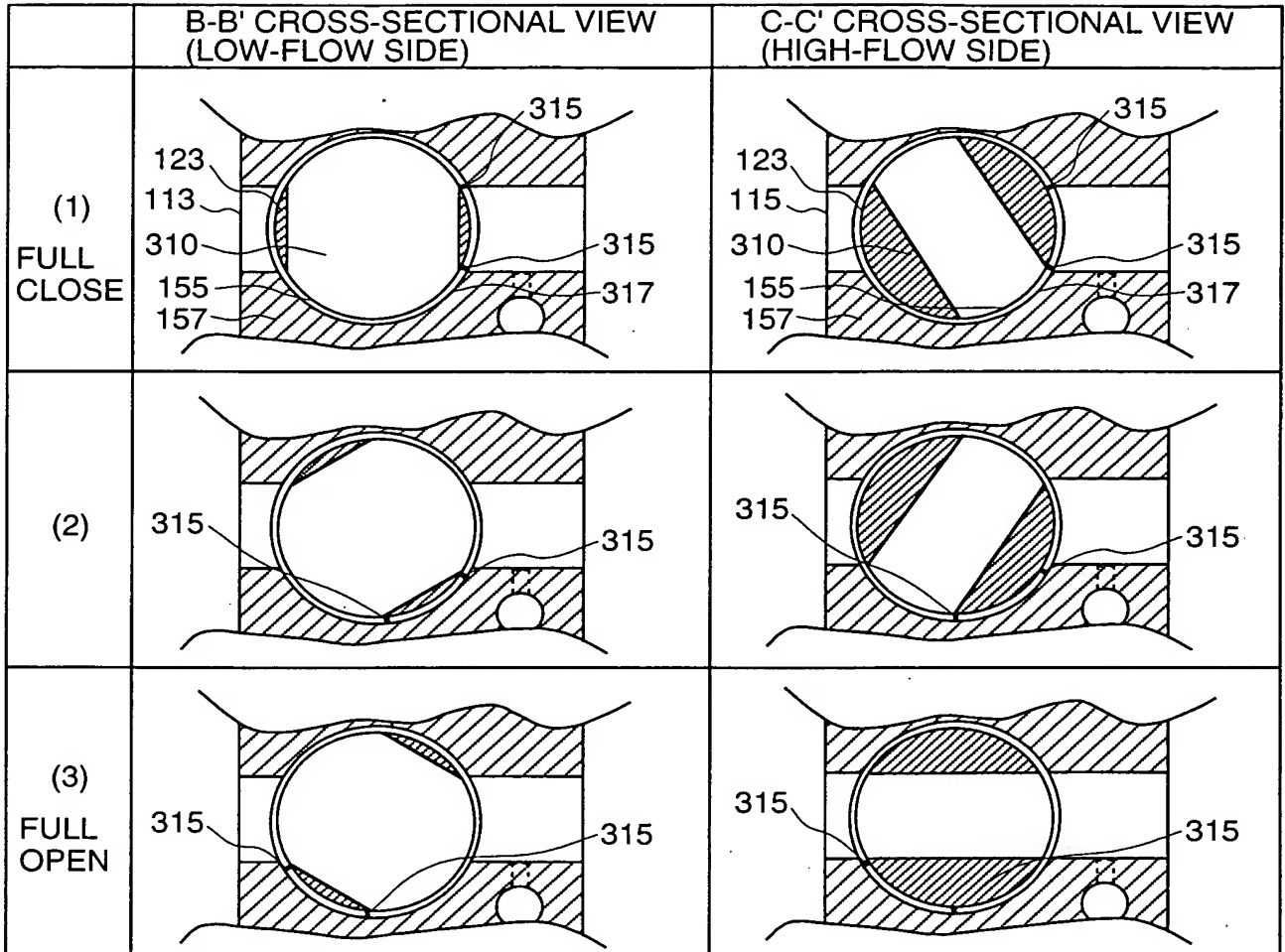
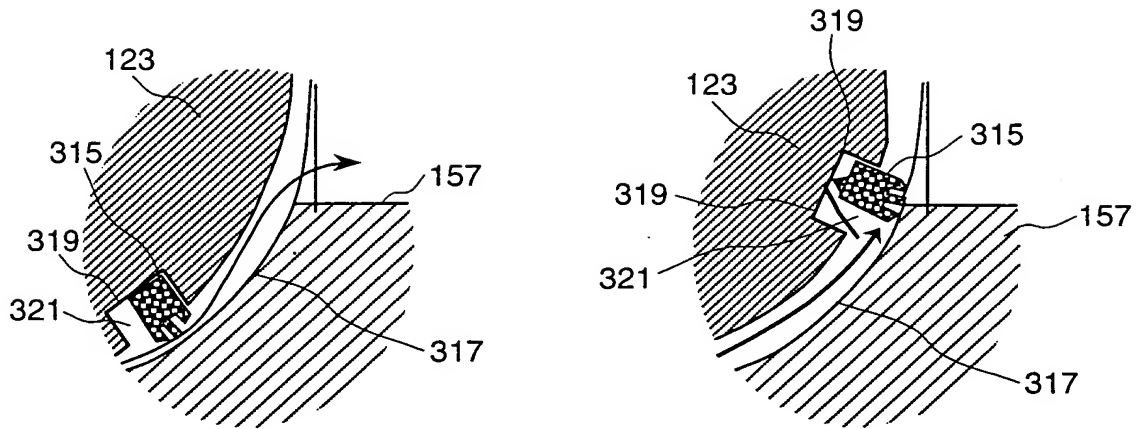
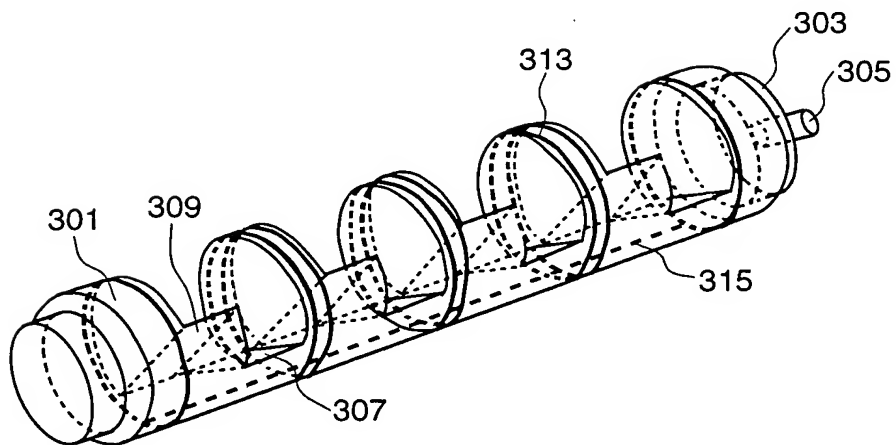
FIG. 21

FIG. 22

(1) WHEN THE PRESSURE
DIFFERENCE BETWEEN THE
UPSTREAM AND DOWNSTREAM
OF THE AIR FLOW CONTROL
VALVE IS SMALL

(2) WHEN THE PRESSURE
DIFFERENCE BETWEEN THE
UPSTREAM AND DOWNSTREAM
OF THE AIR FLOW CONTROL
VALVE IS GREAT

FIG. 23

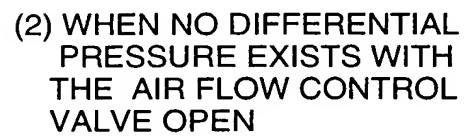
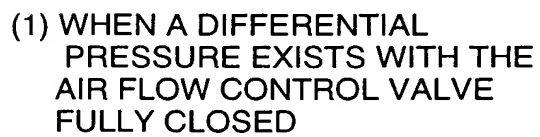


FIG. 25

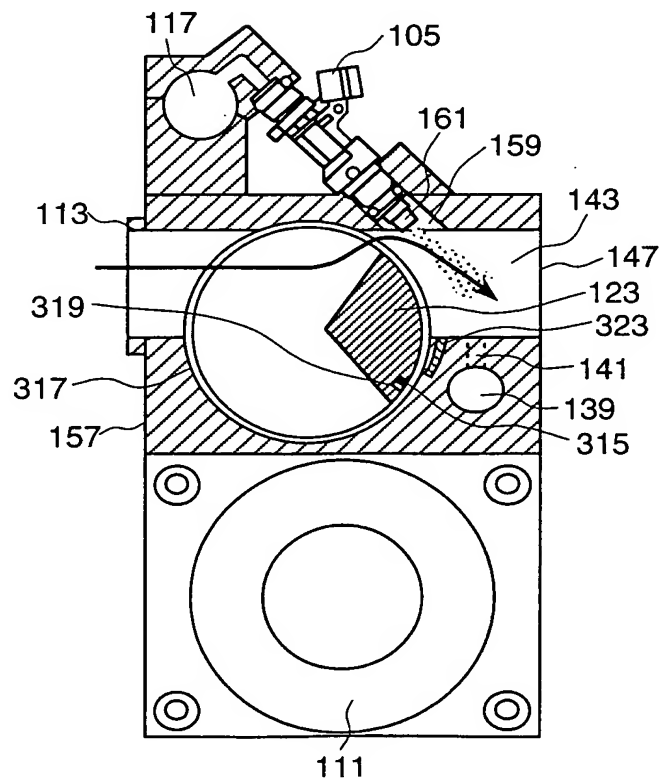
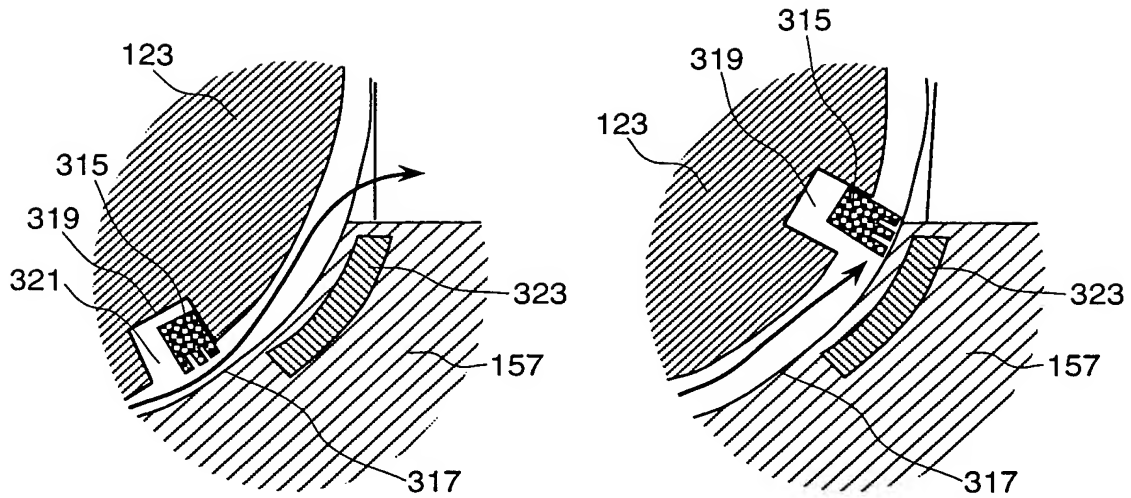
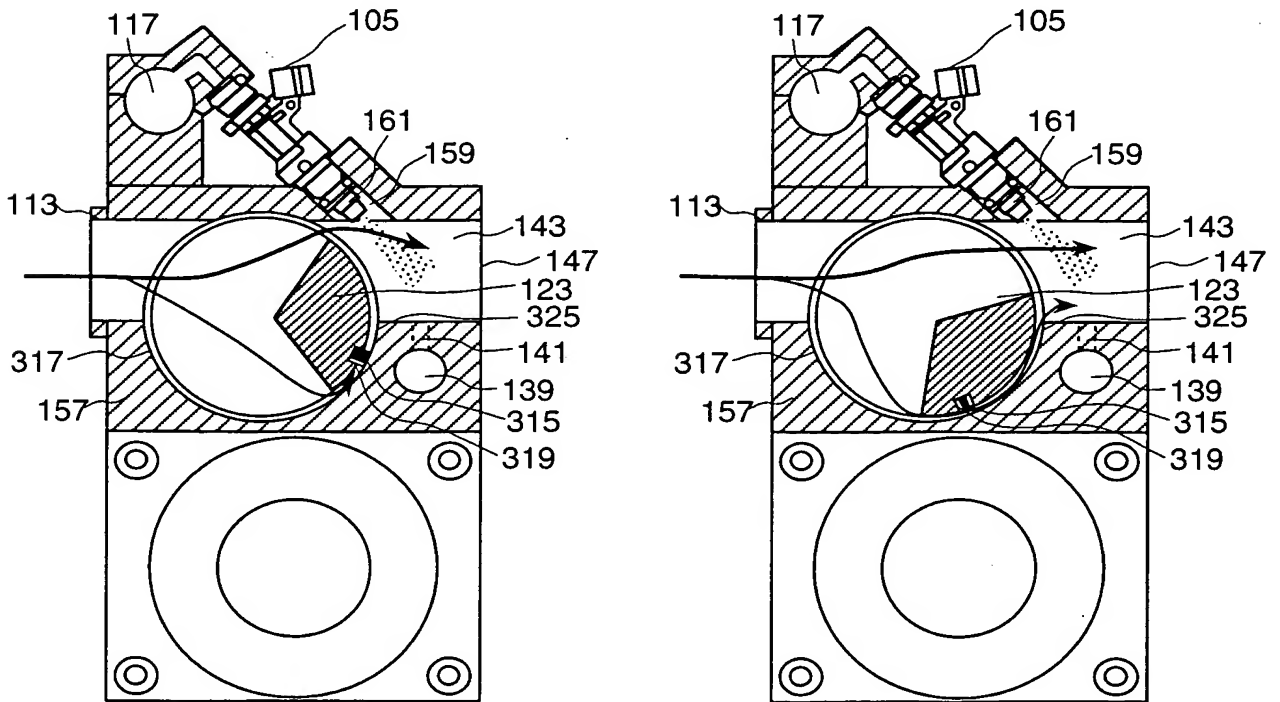


FIG. 26

(1) WHEN THE PRESSURE DIFFERENCE BETWEEN THE UPSTREAM AND DOWNSTREAM OF THE AIR FLOW CONTROL VALVE IS SMALL

(2) WHEN THE PRESSURE DIFFERENCE BETWEEN THE UPSTREAM AND DOWNSTREAM OF THE AIR FLOW CONTROL VALVE IS GREAT

FIG. 27

(1) WHEN MOVABLE SEALING MEMBER 315 IS CLOSE TO CURVATURE REDUCER 325

(2) WHEN MOVABLE SEALING MEMBER 315 IS NOT CLOSE TO CURVATURE REDUCER 325

FIG. 28

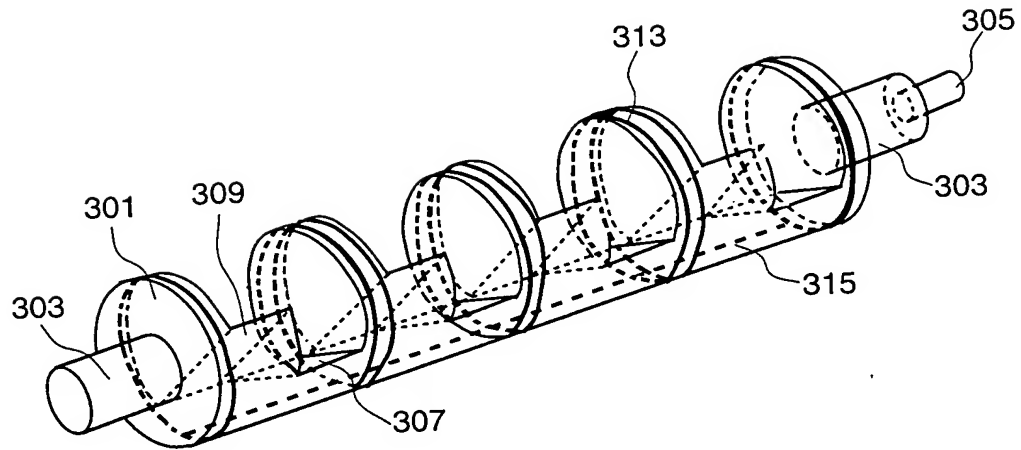
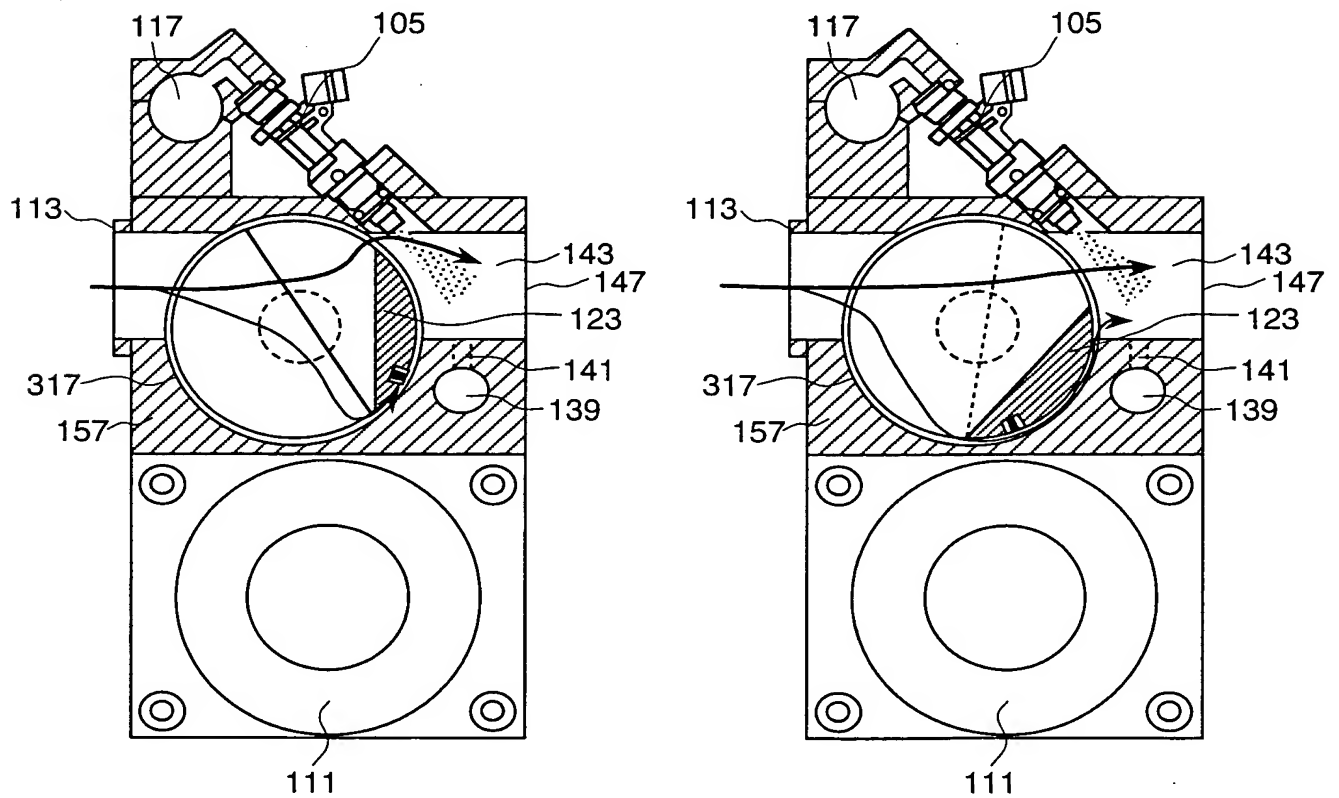


FIG. 29



(1) WHEN DIFFERENTIAL PRESSURE IS GREAT

(2) WHEN DIFFERENTIAL PRESSURE IS SMALL

FIG. 30

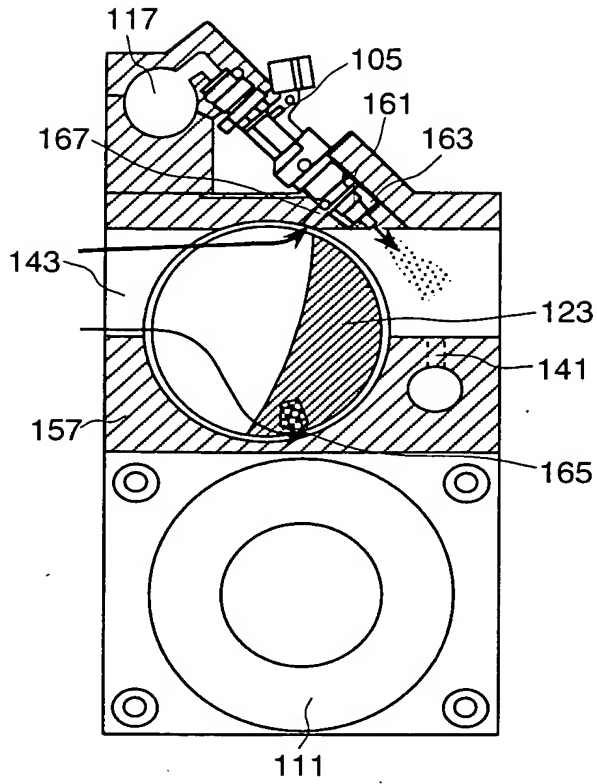


FIG. 31

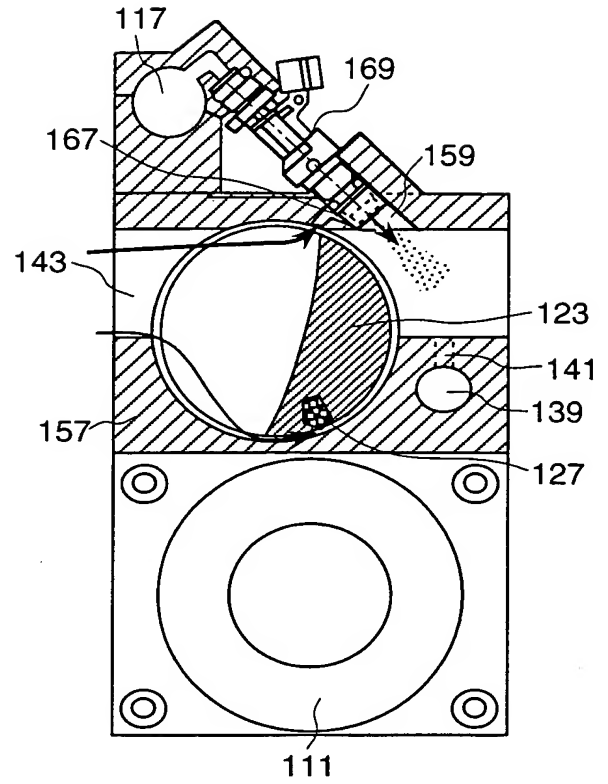


FIG. 32

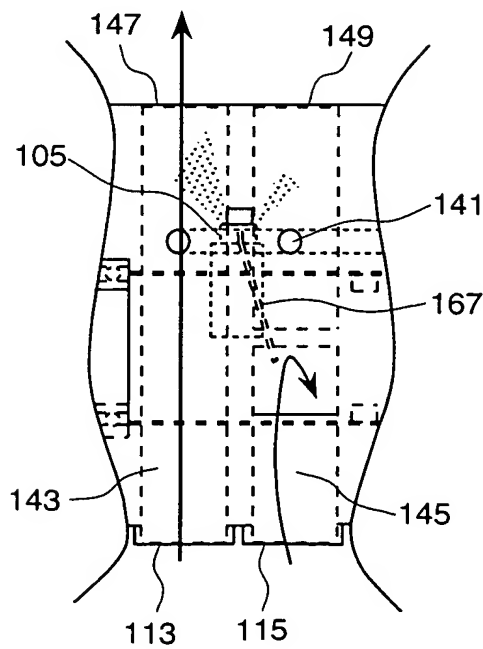


FIG. 33

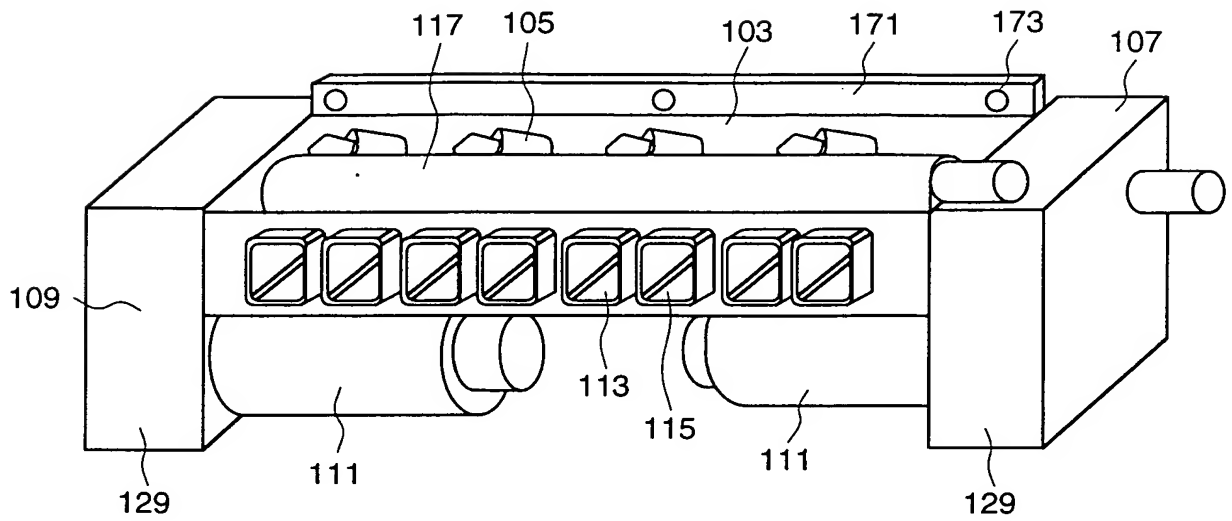


FIG. 34

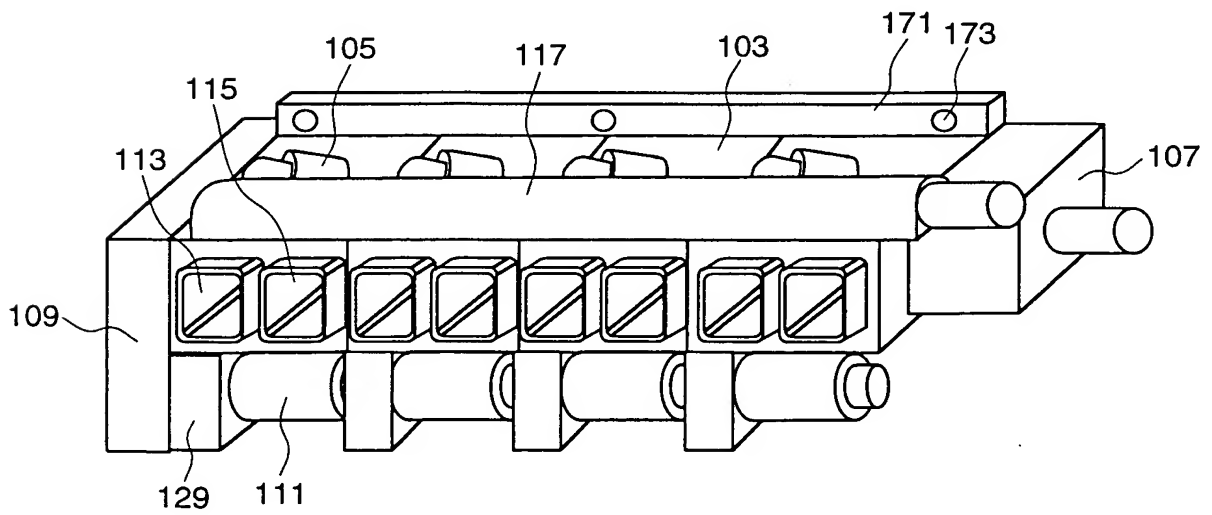
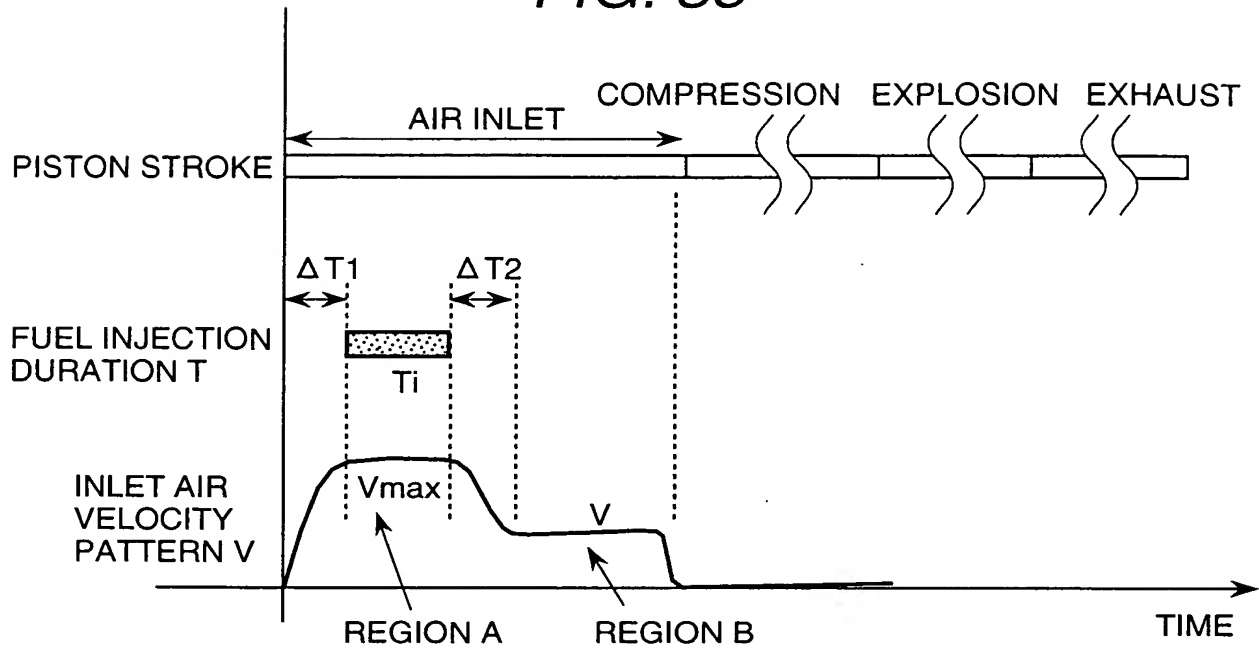
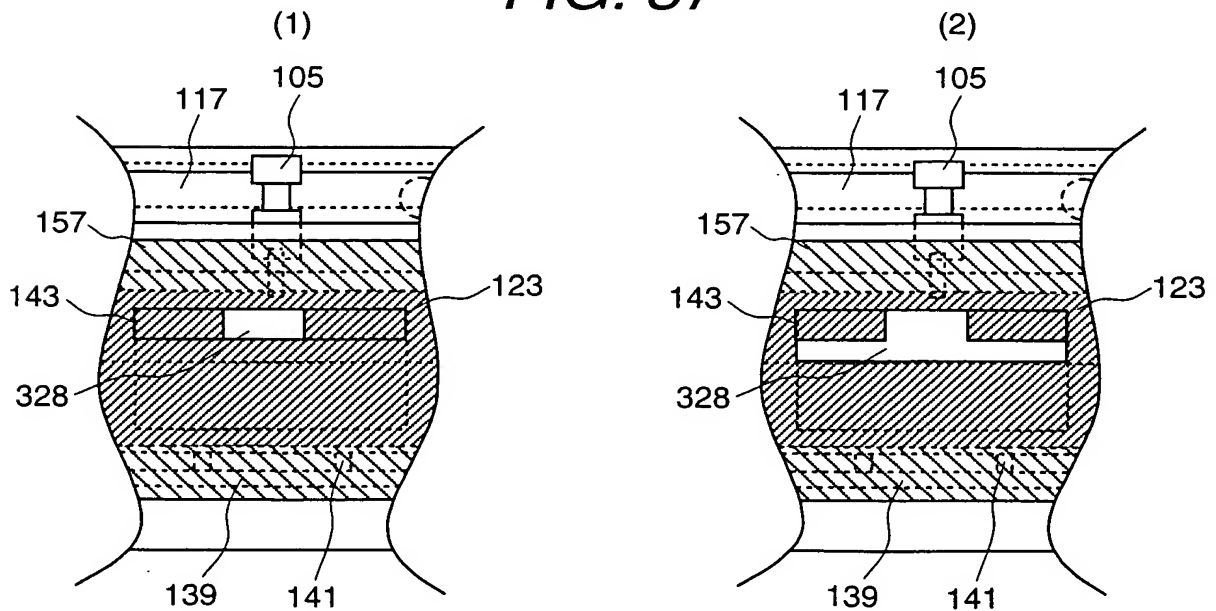


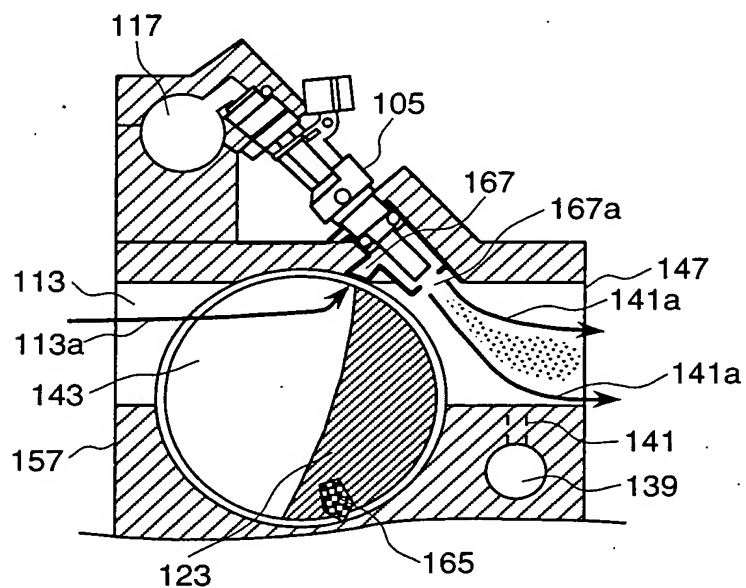
FIG. 35

OR FUEL IS INJECTED ONCE EVERY 2 REVOLUTIONS, WHEREIN, DURING THE FIRST INLET STROKE, THE FUEL IS ATOMIZED AT SMALL VALVE ANGLE AND DURING THE NEXT INLET STROKE, THE ATOMIZED FUEL PARTICLES ARE CARRIED AT LARGE VALVE ANGLE (AT NECESSARY ANGLE, WITHOUT INJECTION)

FIG. 37

THE VELOCITY AROUND THE NOZZLE CHANGES STEPWISE

(1) REGION OF VELOCITY A



(2) REGION OF VELOCITY B

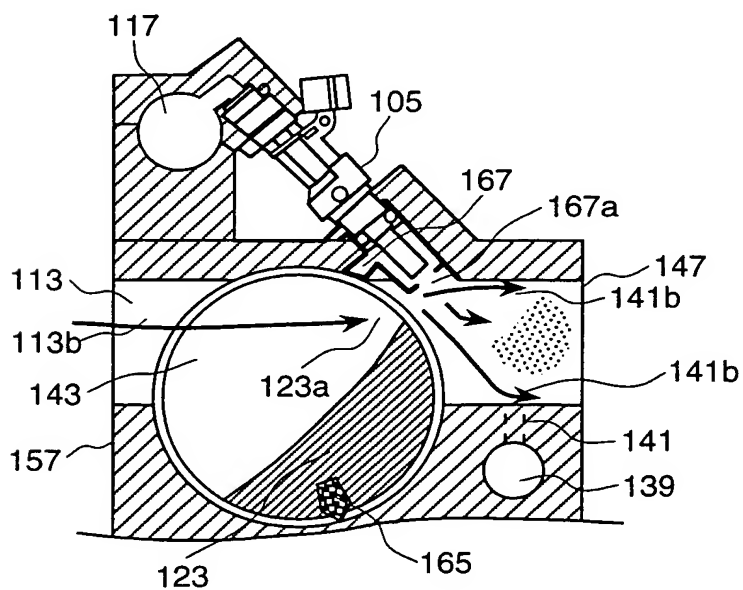
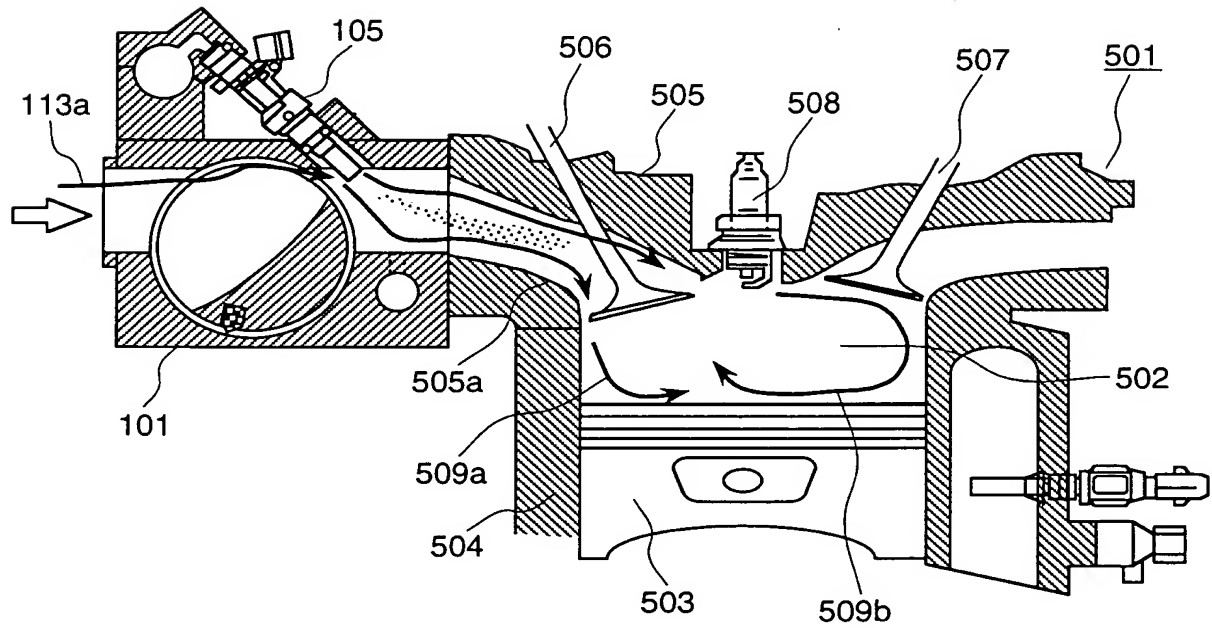
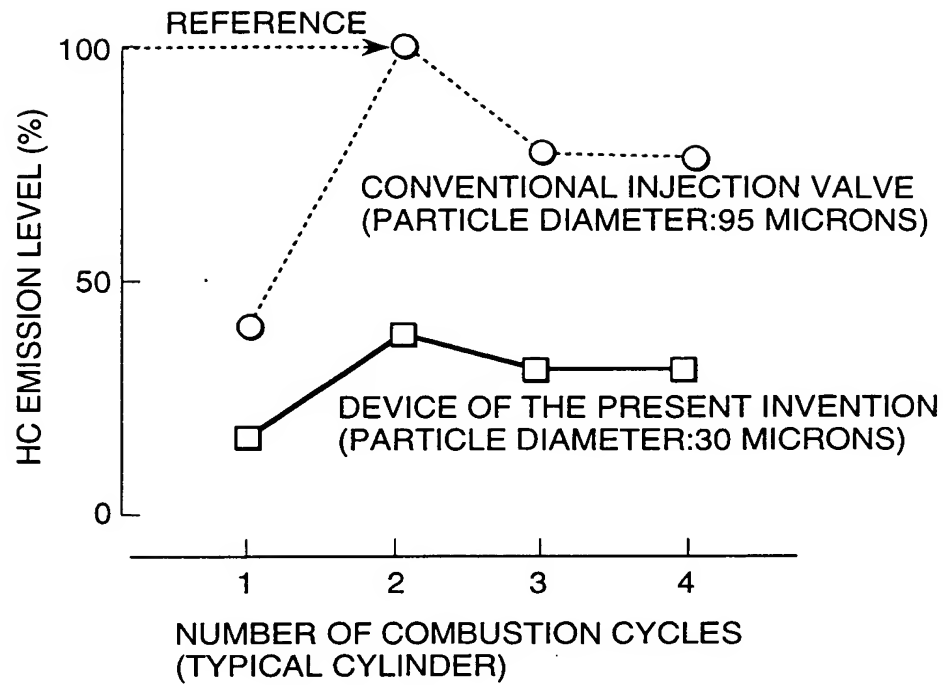
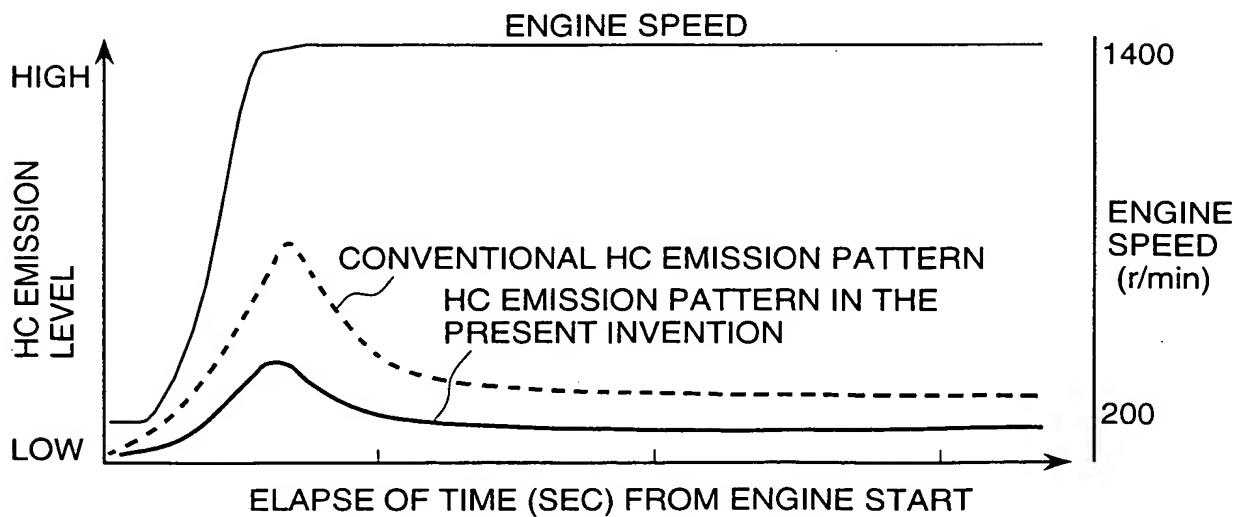


FIG. 38

FUEL IS PREFERABLY INJECTED TOWARDS THE WALL SURFACE OF THE CYLINDER HEAD IN IMMEDIATE FRONT OF THE AIR INLET VALVE. HEREBY, THE FUEL IS PULLED TO THE TOP WALL SIDE BY AIR STREAM.

FIG. 39

(A SECOND HC EMISSION LEVEL IS TAKEN AS REFERENCE)

FIG. 40

(COMPARISONS DURING 20 SECONDS FROM START TO FIRST IDLLING)